From: Kemp, Steve
To: McLarty, Cody
Subject: ODMB Trip Report for 1-14-21
Date: Monday, January 25, 2021 2:18:28 PM
Attachments: Site visit and conversation record 1-14-2021.msg
ODMB EQMS 8a TO 68HE0720D0007 - site visit 1-14-21.msg

Cody:

I traveled to Joplin on the morning of 1-14-21. I left Overland Park at about 0539. The weather was cloudy when I left OP and the sky cleared after I reached the Joplin Area. I arrived at Gypstack at about 0820. The gate was closed and locked I opened the gate and went in. Todd Campbell arrived at 0830 and Dan Johnson and James Cross with the City of Joplin arrived at about 0835. We the issues regarding the inappropriate waste placed by the City's contractor. Dan stated he would have staff from the Coty on site the following week to begin removing the inappropriate waste and transporting it to an appropriate disposal facility. The meeting last about 15 minutes then we all left, Todd and I closed and locked the gate and we drove to the E 17th repository to meet with EQM.

The meeting with EQM and Kevin Southard is described in a separate email (attached). After the meeting with EQM and Kevin Southard, Todd and I drove to the Webb City filed office to participate in a conference call with A&M. The conference call is also described in a separate email (attached). After the conference call with A&M, Todd and I drove to MW34 where we met Jon Huthsing of A&M. Todd had to leave but Jon and I walked the area of MW34 discussing several issues regarding the extent of waste.

I left the Oronogo Circle mine property at about 1500 hours. I had not eaten lunch and ate late lunch at a drive through. I returned to Overland Park at about 1810.

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Cody McLarty,
Chief - Mining and Smelter Remediation Section

CODY MCLARTY Digitally signed by CODY MCLARTY
Date: 2021.02.03 16:04:49 -06'00'

From:	Kemp, Steve
To:	Jon Huthsing
Cc:	Richard Clapp; Oliver Cabrera; Campbell, Todd; Blackburn, LizI; Fritz, Koni
Subject:	Site visit and conversation record 1-14-2021
Date:	Friday, January 15, 2021 7:33:00 AM

Jon:

This email is to document issues discussed during my site visit yesterday. You and I met with Todd Campbell briefly at MW34 yesterday at about 1130. Todd had to leave, and you and I proceeded to walk the property.

1. We met at the vacant parking lot on the Norwest corner of W 29th St and S McClelland Blvd. A&M is using this as an access point to conduct work on the east side of the LOD. This access point is necessary because part of the LOD is east of a large storm water culvert that runs through the site. The large construction vehicles should not be running over the top of the culvert.
2. A&M has conducted a significant amount of clearing and grubbing. The area looks very different and is much easier to visually inspect the entire area that it was during my earlier visits.
3. You and I briefly visited the area immediately south of the west end of W 29th St to evaluate whether this area may contain chat. Our visual inspection was inconclusive and we agreed A&M would collect a few samples to be analyzed for Pb, Cd, and Zn.
4. We then proceeded around to the north and east. You pointed out the drainage issues. We agreed on the need to prevent impact from surface water runoff from the work area to the yards of the adjacent property owners you described A&M's plans preventing impact.
5. We walked toward the north and inspected several depressions that appeared to be mine shafts and a few depressions that I could not identify.
6. We looked at an area that is within the boundary of MW34 but about 20-25 feet outside the LOD designated on B&V designs and outside the fence line that A&M established. I gave my approval to extend the fence line around this area and remediate the area.
7. We inspected the hill that is roughly in the middle of, but is excluded, from the LOD. The hill does not appear to be mine waste. On the morning of 1-15-2021 I reviewed the aerial imagery in google earth for 2012 and 2014. The imagery indicates that clean fill was placed on top of mine between 2012 and 2014. Therefore it is appropriate to exclude this area from remediation.

After we completed our inspection of MW34 left the area at about 1230 and proceeded to the Oronogo Circle (OC).

8. We discussed the probable extent of waste that had been placed in the area marked on the map provided in the contract. During discussion I stated the waste was estimated to be about 40 feet deep and we determined that potholing the waste would not be useful.
9. We inspected the area where EPA indicated A&M should construct a berm to prevent surface water runoff water leaving the highway and flowing into the OC property. There are several issues:
    a. A&M needs to stay out of the ROW for the Hwy. You will contact MoDOT to have them delineate the ROW.

b. If A&M constructs the berm as indicated on the site map in the contract, it may cause water to pool into the low area between the Hwy and the berm.

c. It may be possible to construct a shorter berm than I depicted on the map for the site to prevent surface water runoff flowing into the site.

d. During our discussion, I realized that part of the issue is that prior to remediation work conducted by PRP's, it is likely that mine waste extended all the way to the edge of the highway. I reviewed aerial imagery on the morning of 1-15-21. My review indicaes this is very likely the case. Therefore it is possible there was always flow of water from the highway toward the mine but it was flowing through the mine waste below ground surface where it was less noticeable by the land owner. This is a common situation at the ODMB site.

Please review this and let me know if I forgot to include any topics discussed or if I incorrectly characterized our discussions.

Thanks.

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From:	Kemp, Steve
To:	Jason Smith; Barry Appleton; Bryer Smith
Cc:	Craig Hoby; Fritz, Koni; Campbell, Todd; Blackburn, LizI; Hagenmaier, Elizabeth
Subject:	ODMB EQMS 8a TO 68HE0720D0007 - site visit 1-14-21
Date:	Wednesday, January 20, 2021 9:03:00 AM
Attachments:	EPA Revisions to the design of the Kevin Southard south property 112219.pdf

Jason:

This email is a followup to our meeting at the E 17th St repository last week on 1-14-2021. Todd Campbell and I met with you, Barry Appleton and Bryer Smith at the repository at about 0930. Mr. Kevin Southard arrived at about 0935.

1. You and I discussed the fact that EQMS will remove all of the fence between the K Southard property and the E 17th St repos and replace the fence upon completion of the work. EQMS will submit a proposed cost for removal and replacement of the length of fence that exceeds the current limit of CLIN 0005AA of 2000 linear feet. EQMS estimates this will be 624 LF based on the RFI from Craig Hoby on 1-13-2-21.

2. We discussed the changes that Mr. Southard requested during a previous site visit this past summer. Although, I sent the map depicting the changes to Mr. Southard a few months back he had not seen the map (attached). Mr. Southard is generally ok with the revisions depicted on the attached sketch. He agreed that EQMS may divert stormwater runoff to the existing retention basin in the short term, with the understanding that EPA will fill the retention basin with mine waste and complete the basin as an additional small repository as part of a subsequent contract. Mr. Southard confirmed my understanding from the previous meeting that he prefers the stabilized swale run from west to east along the north end of his property. Mr. Southard also requested that the top of the berm around the current retention basin be cut down 4-5 feet at the time the small repository is completed and I agreed.

3. Mr. Southard asked whether the monuments could be removed. I stated that this is not part of the work that EPA is allowed to perform with remedial funds and is not part of EPA's current task order with EQMS. You and Mr. Southard discussed some possible options that will not be part of EQMS' work for EPA.

Todd and I left the site at 0950 to attend a meeting at 1000. One topic that you and I did not get a chance to discuss was the issue with the additional mine waste EQMS observed in the ditch that parallels E 17th St on the south side of the road. I plan to return around 2-3-21. We can discuss the issue then.

Please review this email and let me know if I forgot any topics discussed or did not accurately describe any aspect of our discussion. Thank you.

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Stone Check Dam or berm around culvert inlet to prevent sediment from swamping the inlet.

New alignment of SE swale

Stabilized swale with check dams across the swale to minimize sediment

03 C-602 ROCK CULVERT LINER

03 C-603 24" DUAL WALL SMOOTH INTERIOR HDPE PIPE

02 C-401 SPILLWAY

WATER ELEV 1022.54

REGRADE ERODED AREAS TO REMOVE RILLS AND GULLIES

25% SIDE SLOPES ON BERM

25% SIDE SLOPES IN SWALE

REMOVE AND REPLACE FENCE (1,910 LF)

1022.75

1032.67

1042.12

1.02%

20'

5'

ELM LN

LOD

BLACK & VEATCH
32 READS WAY
NEW CASTLE, DELAWARE 19720
PHONE: (302) 544-6800 FAX: (302) 544-8691
WEBSITE: WWW.BV.COM

Rev.	Description	Date	Apr.
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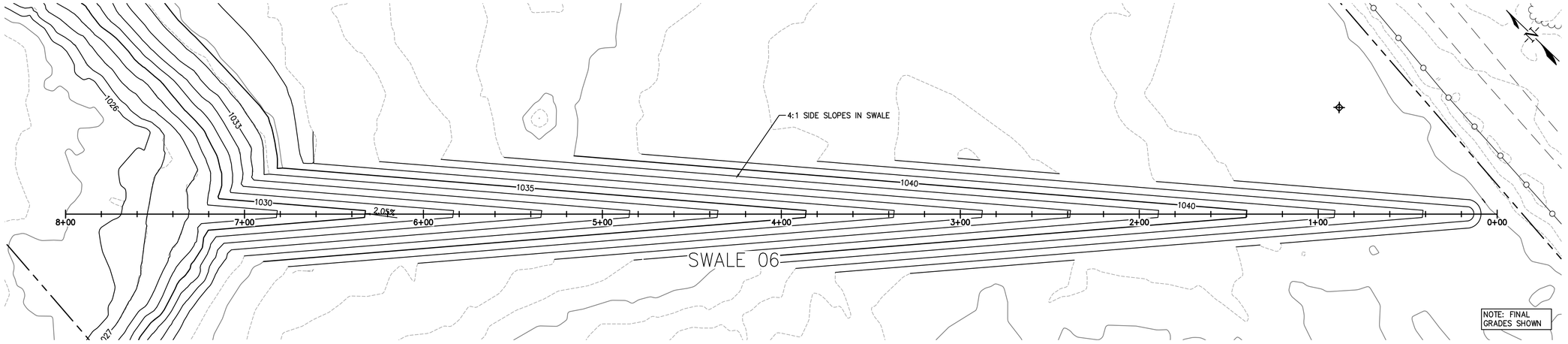
Date: 11/22/19
Project #: 044806
Drawn by: NJS
Design by: NJS
Check by: GEH
Review by: GEH
SCALE: 1" = 100'
100' 50' 0 100'

ORONOGO-DUENWEG MINING BELT SUPERFUND SITE
PHASE 01
EAST 17TH STREET REPOSITORY
INTERMEDIATE REMEDIAL DESIGN BID SET
EPA REGION 7

EXCAVATION GRADING PLAN

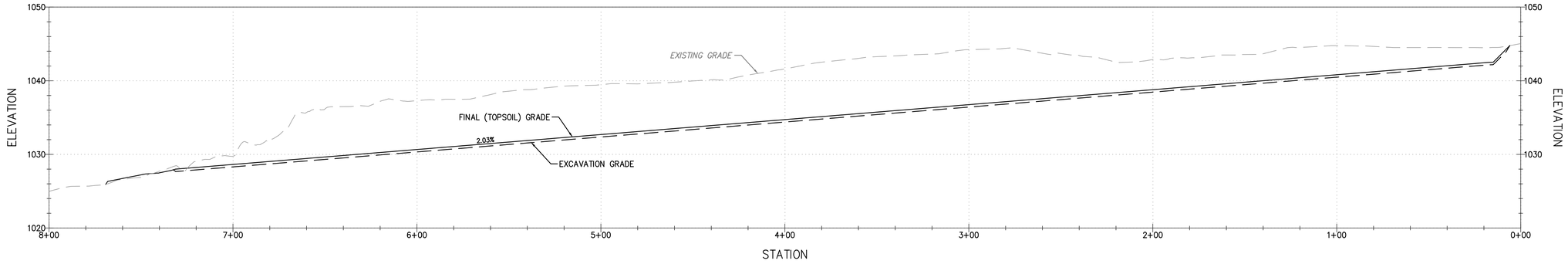
DRAWING NO.
C-201



01
C-402

SWALE 06

SCALE: AS SHOWN



PROFILE VIEW OF SWALE 06

PROFILE VIEW SCALES:

HORIZONTAL: 1"=30'
VERTICAL: 1"=7.5'

BLACK & VEATCH
32 READS WAY
NEW CASTLE, DELAWARE 19720
PHONE: (302) 544-9880 FAX: (302) 544-9891
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Date: 11/22/19
Project #: 048806
Drawn by: NJS
Design by: NJS
Check by: GEH
Review by: GEH

ORONOGO-DUENWEG MINING BELT SUPERFUND SITE
PHASE 01
EAST 17TH STREET REPOSITORY
INTERMEDIATE REMEDIAL DESIGN BID SET
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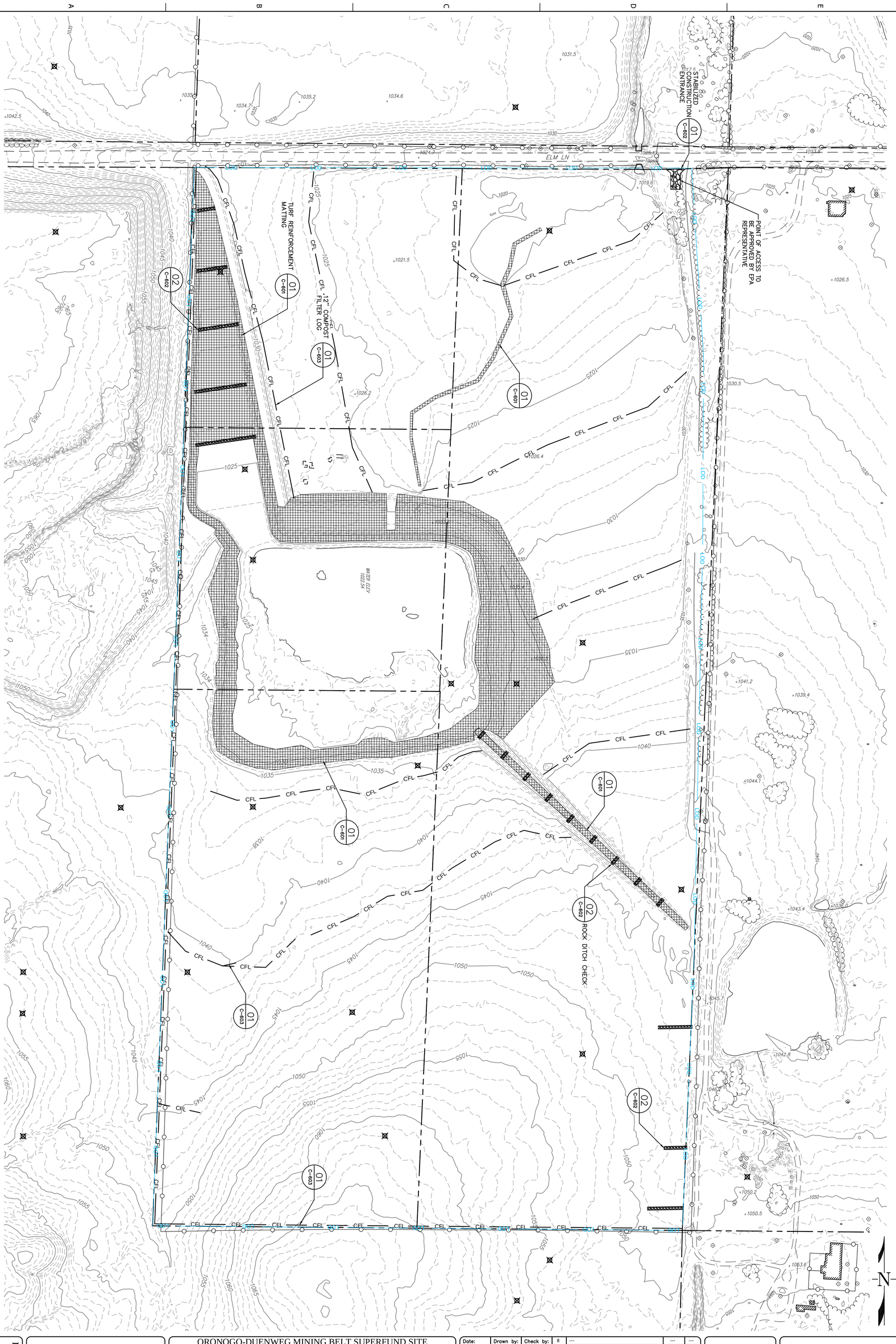
STORMWATER PROFILES

DRAWING NO.
C-402



DRAWING NO.
C-501

EROSION AND SEDIMENT CONTROL PLAN

ORONOGO-DUENWEG MINING BELT SUPERFUND SITE

PHASE 01
EAST 17TH STREET REPOSITORY
INTERMEDIATE REMEDIAL DESIGN BID SET

EPA REGION 7

Date:	Drawn by:	Check by:
11/22/19	NJS	GEH
Project #:	Design by:	Review by:
044806	NJS	GEH

SCALE: 1" = 100'

Rev.	Description	Date	Apr.
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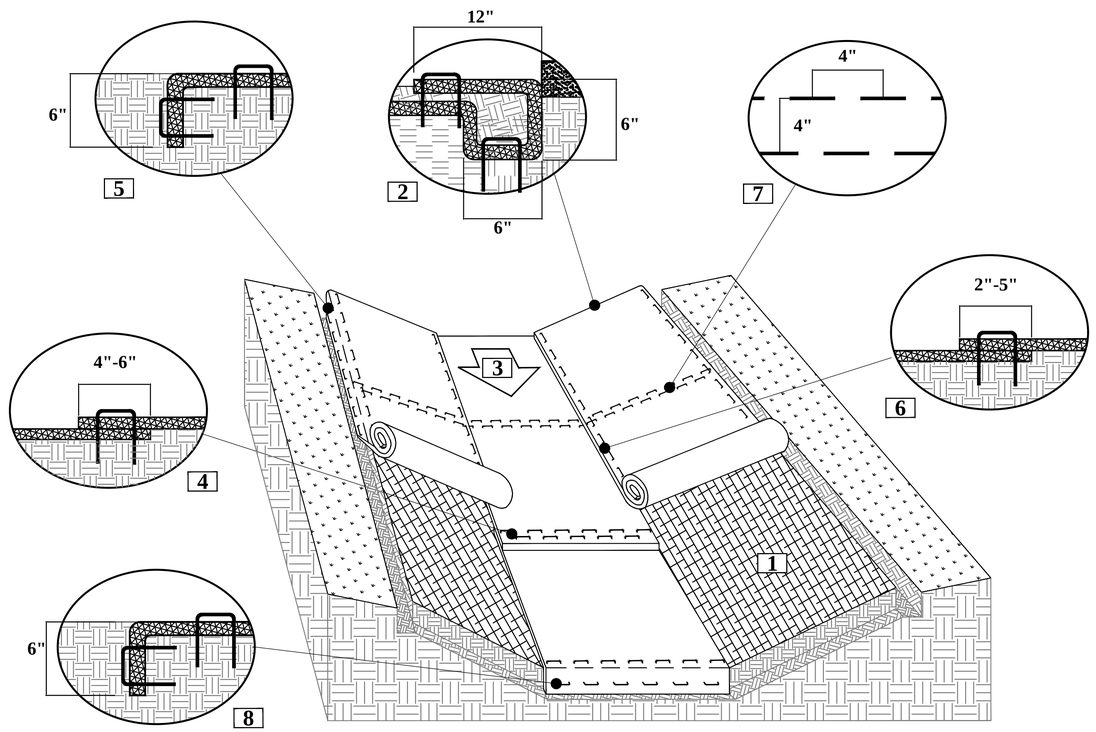
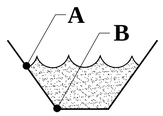
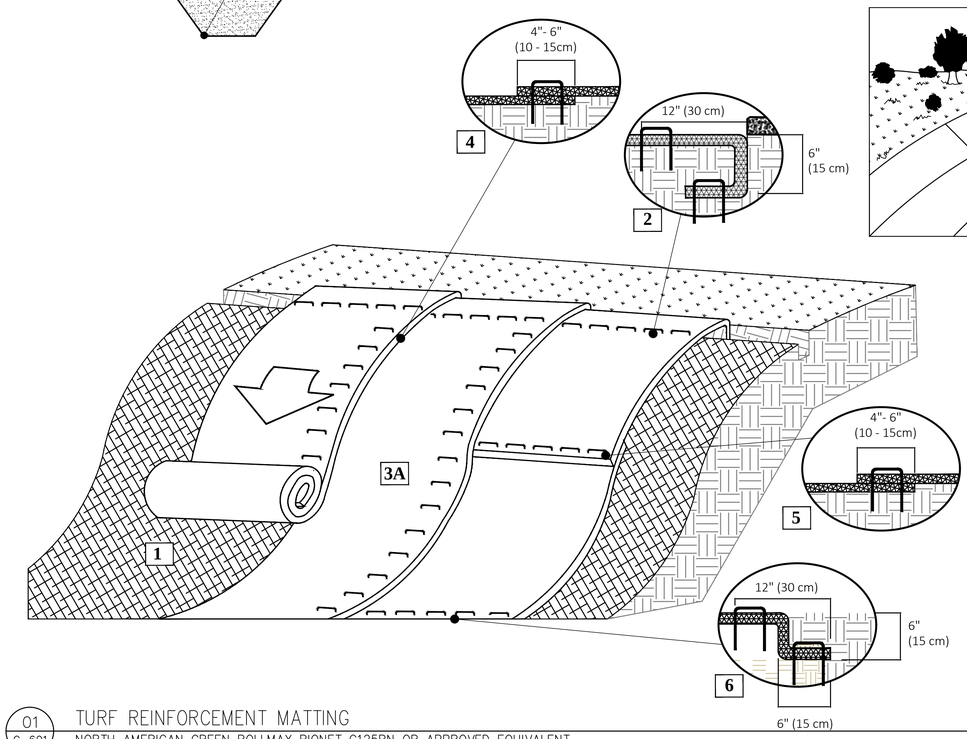


CRITICAL POINTS
A. PROJECTED WATER LINE
B. CHANNEL BOTTOM/SIDE SLOPE VERTICES



NOTES:
*HORIZONTAL STAPLE SPACING SHOULD BE ALTERED IF NECESSARY TO ALLOW STAPLES TO SECURE THE CRITICAL POINTS ALONG THE CHANNEL SURFACE.

**IN LOOSE SOIL CONDITIONS, THE USE OF STAPLE OR STAKE LENGTHS GREATER THAN 6"MAY BE NECESSARY TO PROPERLY SECURE THE RECP'S.

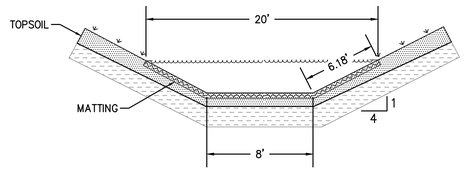


01
C-601

TURF REINFORCEMENT MATTING
NORTH AMERICAN GREEN ROLLMAX BIONET C125BN OR APPROVED EQUIVALENT

CHANNEL INSTALLATION NOTES:

1. PREPARE SOIL BEFORE INSTALLING ROLLED EROSION CONTROL PRODUCTS (RECPS), INCLUDING ANY NECESSARY APPLICATION OF LIME, FERTILIZER, AND SEED.
2. BEGIN AT THE TOP OF THE CHANNEL BY ANCHORING THE RECPS IN A 6" DEEP X 6" WIDE TRENCH WITH APPROXIMATELY 12" OF RECPS EXTENDED BEYOND THE UP-SLOPE PORTION OF THE TRENCH. USE SHOREMAX MAT AT THE CHANNEL/CULVERT OUTLET AS SUPPLEMENTAL SCOUR PROTECTION AS NEEDED. ANCHOR THE RECPS WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" APART IN THE BOTTOM OF THE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING. APPLY SEED TO THE COMPACTED SOIL AND FOLD THE REMAINING 12" PORTION OF RECPS BACK OVER THE SEED AND COMPACTED SOIL. SECURE RECPS OVER COMPACTED SOIL WITH A ROW OF STAPLES/STAKES SPACED APPROXIMATELY 12" APART ACROSS THE WIDTH OF THE RECPS.
3. ROLL CENTER RECPS IN DIRECTION OF WATER FLOW IN BOTTOM OF CHANNEL. RECPS WILL UNROLL WITH APPROPRIATE SIDE AGAINST THE SOIL SURFACE. ALL RECPS MUST BE SECURELY FASTENED TO SOIL SURFACE BY PLACING STAPLES/STAKES IN APPROPRIATE LOCATIONS AS SHOWN IN THE STAPLE PATTERN GUIDE.
4. PLACE CONSECUTIVE RECPS END-OVER-END (SHINGLE STYLE) WITH A 4"-6" OVERLAP. USE A DOUBLE ROW OF STAPLES STAGGERED 4" APART AND 4" ON CENTER TO SECURE RECPS.
5. FULL LENGTH EDGE OF RECPS AT TOP OF SIDE SLOPES MUST BE ANCHORED WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" APART IN A 6" DEEP X 6" WIDE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING.
6. ADJACENT RECPS MUST BE OVERLAPPED APPROXIMATELY 2"-5" (DEPENDING ON RECPS TYPE) AND STAPLED.
7. IN HIGH FLOW CHANNEL APPLICATIONS A STAPLE CHECK SLOT IS RECOMMENDED AT 30 TO 40 FOOT INTERVALS. USE A DOUBLE ROW OF STAPLES STAGGERED 4" APART AND 4" ON CENTER OVER ENTIRE WIDTH OF THE CHANNEL.
8. THE TERMINAL END OF THE RECPS MUST BE ANCHORED WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" APART IN A 6" DEEP X 6" WIDE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING.

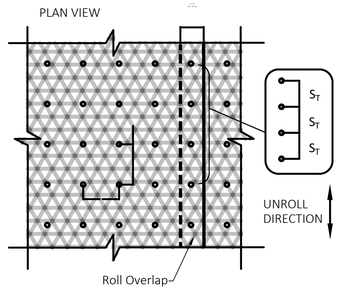


TYPICAL SECTION

SLOPE INSTALLATION NOTES:

1. PREPARE SOIL BEFORE INSTALLING ROLLED EROSION CONTROL PRODUCTS (RECPS), INCLUDING ANY NECESSARY APPLICATION OF LIME, FERTILIZER, AND SEED. GROUND SURFACE MUST BE FREE OF DEBRIS, ROCKS, CLAY CLODS AND RAKED SMOOTH SUFFICIENT TO ALLOW INTIMATE CONTACT OF THE RECP WITH THE SOIL OVER THE ENTIRETY OF THE INSTALLATION.
2. BEGIN AT THE TOP OF THE SLOPE BY ANCHORING THE RECPS IN A 6" DEEP X 6" WIDE TRENCH. ANCHOR THE RECPS WITH A ROW OF STAPLES/STAKES SPACED AT S_T APART IN THE BOTTOM OF THE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING AND FOLD THE ROLL OVER DOWNSLOPE. SECURE RECPS OVER COMPACTED SOIL WITH A ROW OF STAPLES/STAKES SPACED AT S_T APART ACROSS THE WIDTH OF THE RECPS.
3. ROLL THE RECPS (A) DOWN OR (B) HORIZONTALLY ACROSS THE SLOPE. RECPS WILL UNROLL WITH APPROPRIATE SIDE AGAINST THE SOIL SURFACE. ALL RECPS MUST BE SECURELY FASTENED TO SOIL SURFACE BY PLACING STAPLES/STAKES IN APPROPRIATE LOCATIONS AS SHOWN IN THE STAPLE PATTERN GUIDE. ROLLMAX RECPS AND ECBS SHOULD UTILIZE STAPLE PATTERN C, TRMS AND VMAX MATERIALS SHOULD UTILIZE STAPLE PATTERN D.
4. THE EDGES OF PARALLEL RECPS MUST BE STAPLED WITH APPROXIMATELY 4" – 6" OVERLAP.
5. CONSECUTIVE RECPS SPLICED DOWN THE SLOPE MUST OVERLAPPED WITH THE UPSTREAM MAT ATOP THE DOWNSTREAM MAT (SHINGLE STYLE). THE OVERLAP SHOULD BE 4" – 6".
6. AT THE TERMINAL END, SECURE EACH MAT ACROSS THE WIDTH WITH A ROW OF STAPLES/STAKES SPACED AT S_T. IF EXPOSED TO FLOW, FOOT TRAFFIC, WIND UPLIFT OR OTHER DISRUPTION, TRENCH THE TERMINAL END IN AS SHOWN IN DETAIL.
7. FASTENERS SHOULD PROVIDE A MINIMUM OF TWENTY POUNDS OF PULLOUT RESISTANCE. SIX-INCH (10 CM) X ONE-INCH ELEVEN GAUGE STAPLES ARE TYPICALLY ADEQUATE. IN LOOSE SOILS, LONGER STAPLES MAY BE NECESSARY, TWIST PINS CAN PROVIDE THE GREATEST PULLOUT RESISTANCE. IN HARD OR ROCKY SOILS, STRAIGHT PINS MAY BY USED WHERE STAPLES OR TWIST PINS ARE REFUSED, PROVIDED THE MINIMUM PULLOUT REQUIREMENTS ARE MET.

STAPLE PATTERN GUIDE



- PIN / STAPLE / TWIST PIN, AS APPROPRIATE FOR FIELD CONDITIONS

	Staple Pattern	
Dimension	C	D
W_T	30" (75 cm)	22" (55 cm)
L_T	30" (75 cm)	22" (55 cm)
S_T	18" (45 cm)	18" (45 cm)
Nominal Frequency	1.7 / SY	3.0 / SY

*Note: Staple Pattern A and B used prior to 8/2019 has been discontinued.

BLACK & VEATCH
32 READS WAY
NEW CASTLE, DELAWARE 19720
PHONE: (302) 544-6888 FAX: (302) 544-9691
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Rev.	Description	Date	Apr.
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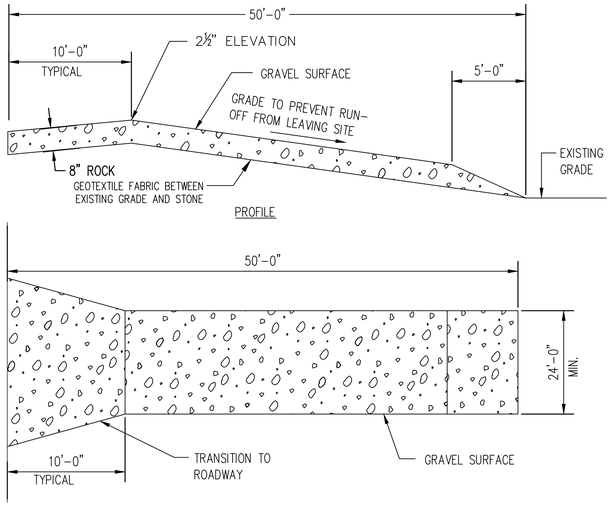
Date: 11/22/19
Project #: 048806
Drawn by: NJS
Design by: NJS
Check by: GEH
Review by: GEH

ORONOGO-DUENWEG MINING BELT SUPERFUND SITE
PHASE 01
EAST 17TH STREET REPOSITORY
INTERMEDIATE REMEDIAL DESIGN BID SET
EPA REGION 7

CONSTRUCTION DETAILS

DRAWING NO.
C-601



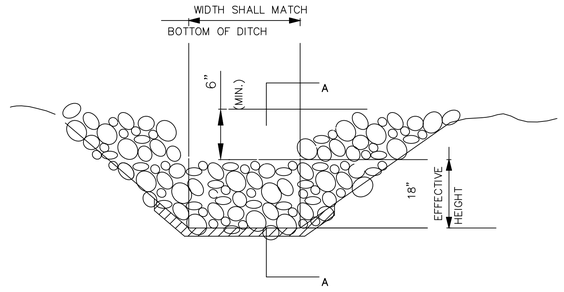
PROFILE

PLAN VIEW

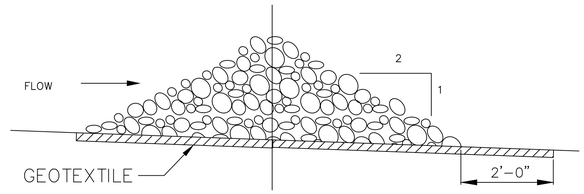
ENTRANCE NOTES

1. STONE SIZE: 3" TO 5" OPEN GRADE ROCK.
2. LENGTH: AS EFFECTIVE, BUT NOT LESS THAN 50'-0".
3. THICKNESS: NOT LESS THAN 8 INCHES.
4. WIDTH: NOT LESS THAN FULL WIDTH OF ALL POINTS OF INGRESS OR EGRESS.
5. WASHING: WHEN NECESSARY, WHEELS SHALL BE CLEANED TO REMOVE SEDIMENT PRIOR TO ENTRANCE ONTO ROADWAY. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH CRUSHED STONE WHICH DRAINS INTO AN APPROVED TRAP OR SEDIMENT BASIN. ALL SEDIMENTS SHALL BE PREVENTED FROM ENTERING ANY STORM DRAIN, DITCH, OR WATER COURSE USING APPROVED METHODS.
6. MAINTENANCE: THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH SHALL PREVENT TRACING OR FLOWING OF SEDIMENT ONTO ROADWAYS. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND AND REPAIR AND OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, DROPPED WASHED OR TRACKED ONTO ROADWAY SHALL BE REMOVED IMMEDIATELY.
7. DRAINAGE: ENTRANCE SHALL BE PROPERLY GRADED OR A DRAINAGE SWALE SHALL BE INCORPORATED TO PREVENT RUNOFF FROM LEAVING THE CONSTRUCTION SITE.

01 C-602 STABILIZED CONSTRUCTION ENTRANCE



END VIEW



SECTION A-A

NOTES:

ROCK DITCH CHECK IN THE CLEAR ZONE SHALL BE REMOVED OR LEVELED (IF ALLOWABLE) AFTER THE VEGETATION HAS SUFFICIENTLY MATURED TO PROTECT THE DITCH OR SWALE.

COVER THE ENTIRE FOUNDATION, INCLUDING BOTH EARTH ABUTMENTS, WITH FILTER FABRIC, MAKING SURE THE UPSTREAM STRIPS OVERLAP THE DOWNSTREAM STRIPS AT LEAST 1 FT AND THE UPSLOPE IS KEYED IN.

ROCK CHECK DAM SHALL BE CONSTRUCTED WITH CLEAN ROCK. A MINIMUM OF 50 PERCENT OF THE ROCK SHALL HAVE A DIAMETER OF 9 INCHES OR GREATER. FILTER FABRIC SHALL BE PLACED BENEATH THE ROCK CHECK DAM.

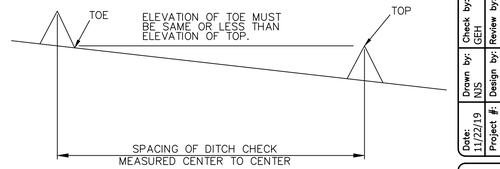
ROCK CHECK DAMS SHALL BE INSTALLED AS NEEDED WITH APPROVAL BY THE PROJECT'S EPA REPRESENTATIVE.

02 C-602 ROCK DITCH CHECK

REF. MODOT DETAIL 806.10J

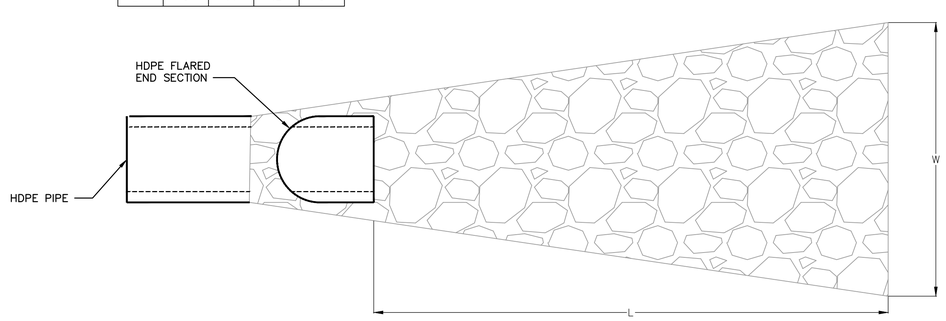
EXAMPLE
DITCH CHECK SPACING
FOR STANDARD HEIGHTS

DITCH SLOPE %	SPACING FOR 9" EFF. HEIGHT (FT)	SPACING FOR 18" EFF. HEIGHT (FT)
0.5	150	300
1.0	75	150
1.5	50	100
2.0	37	75
2.5	30	60
3.0	25	50
3.5	21	43
4.0	19	38
4.5	16	33
5.0	15	30
5.5	13	27
6.0	12	25
6.5	11	23
7.0	10	21
7.5	10	20
8.0	9	19
8.5	9	18
9.0	8	17
9.5	8	16
10.0	7	15



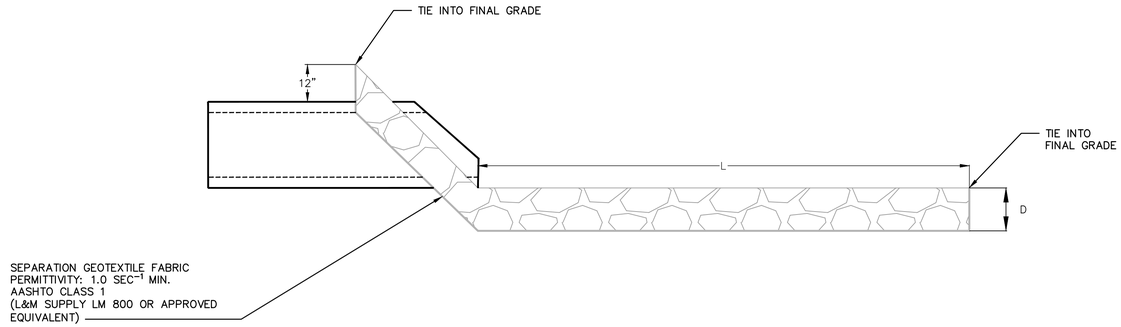
MINIMUM DITCH CHECK SPACING

PIPE SIZE	W (FT)	L (FT) (MIN)	D (IN)	D_{50} (IN)
24"	6	14	12	9



03 C-602 ROCK CULVERT LINER

REF. MODOT DETAIL 690.70C



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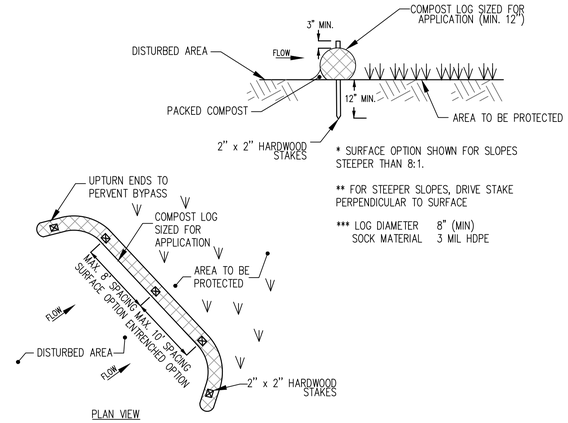
Apr.		

Date: 11/22/19
Project #: 044806
Drawn by: NJS
Design by: NJS
Check by: GEH
Review by: GEH

ORONOGO-DUENWEG MINING BELT SUPERFUND SITE
PHASE 01
EAST 17TH STREET REPOSITORY
INTERMEDIATE REMEDIAL DESIGN BID SET
EPA REGION 7

CONSTRUCTION DETAILS

DRAWING NO.
C-602



PLAN VIEW

* SURFACE OPTION SHOWN FOR SLOPES STEEPER THAN 8:1.

** FOR STEEPER SLOPES, DRIVE STAKE PERPENDICULAR TO SURFACE

*** LOG DIAMETER 8" (MIN)
SOCK MATERIAL 3 MIL HDPE

NOTES:

1. PRIOR TO INSTALLATION, CLEAR BEDDING AREA OF OBSTRUCTIONS INCLUDING ROCKS OR DEBRIS LARGER THAN 1 INCH AND FILL IN ANY SHARP DEPRESSION AREAS.

2. FILL THE SOCK FABRIC USING A PNEUMATIC BLOWER SO THAT THE LOGS ARE RIGID AND DO NOT DEFORM. TERMINATE AT THE DESIRED LENGTH.

3. FOR TRENCHED APPLICATIONS, EXCAVATE 2 TO 4 INCHES BELOW GRADE ALONG THE WIDTH AND LENGTH OF THE COMPOST FILTER LOG.

4. INSTALL THE COMPOST FILTER LOGS PERPENDICULAR TO THE FLOW DIRECTION AND PARALLEL TO THE SLOPE WITH THE BEGINNING AND END OF THE INSTALLATION POINTING UP THE SLOPE A MINIMUM OF 1 FOOT ELEVATION DIFFERENCE. ON SITES WHERE THIS IS NOT POSSIBLE, UPTURN AT A MINIMUM LENGTH OF 10'AT A 30 DEGREE ANGLE TO PREVENT RUNOFF BYPASS.

5. FOR UNTRENCHED APPLICATIONS, BLOW OR HAND PACK SOIL, MULCH, OR COMPOST ON THE UPSLOPE SIDE OF THE LOG, FILLING THE BOTTOM VOID AREA.

6. STAKE THE FILLED LOG EVERY 10 FEET MAXIMUM THROUGH THE CENTER OF THE SOCK FOR TRENCHED APPLICATIONS, OR EVERY 8 FEET FOR UNTRENCHED. THE STAKE SHALL BE A 2" BY 2" HARDWOOD. IT SHOULD EXTEND 12" BELOW GRADE AND PROTRUDE AT LEAST 3" ABOVE THE TOP OF THE SOCK. IF LOCATED ON A SLOPE GREATER THAN 8:1, THE STAKE SHALL BE ANGLED DOWNSLOPE AT A 45 DEGREE ANGLE TO PREVENT THE FORCE OF THE WATER FROM DISLODGING TO LOG.

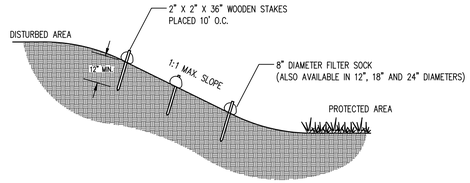
7. WHEN THE LENGTH OF THE COMPOST FILTER LOG NEEDED EXCEEDS THE AVAILABLE COMPOST FILTER SOCK LENGTH, THE NEXT SOCK SHALL BE OVERLAPPED A MINIMUM OF 12" BEFORE BEING FILLED, AND A STAKE PLACED THROUGH BOTH SOCKS AT THE OVERLAP.

8. REMOVE ACCUMULATED SEDIMENT WHEN IT HAS REACHED HALF OF THE EFFECTIVE HEIGHT OF THE LOG.

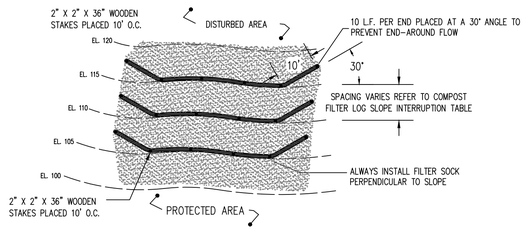
9. INSPECT WEEKLY AND AFTER RAIN EVENT. IF SOCK IS DEGRADING OR THE SOCK IS FAILING, VEGETATE TO SECURE THE COMPOST, REPLACE THE LOG, OR REINFORCE WITH AN ADDITIONAL LOG. IF THE LOG HAS BEEN CRUSHED DUE TO CONSTRUCTION EQUIPMENT, IT CAN BE 'FLUFFED' BACK TO ITS EFFECTIVE HEIGHT. IF THE EFFECTIVE HEIGHT CAN NO LONGER BE RESTORED, THE LOG SHALL BE REPLACED OR REINFORCED WITH AN ADDITIONAL COMPOST FILTER LOG.

SLOPE INTERRUPTION

NTS



SECTION



PLAN

NOTES:

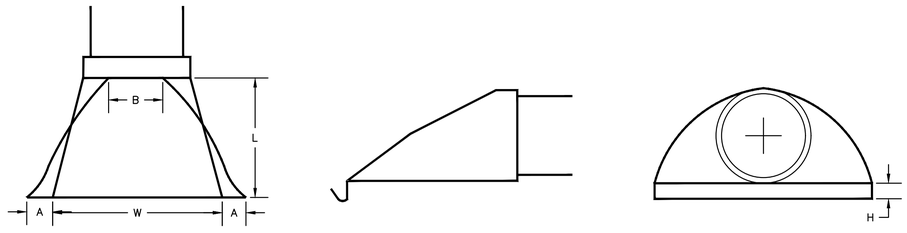
1. REMOVE SEDIMENT FROM THE UPSLOPE SIDE OF THE FILTER SOCK WHEN ACCUMULATION HAS REACHED ½ OF EFFECTIVE HEIGHT OF FILTER SOCK
2. LOOSE FILTER MEDIA MAY BE BACKFILLED ON THE UPSLOPE SIDE OF THE FILTER SOCK TO ENHANCE PERFORMANCE

COMPOST FILTER LOG SLOPE INTERRUPTION TABLE

SLOPE %	MAXIMUM SLOPE LENGTH ABOVE COMPOST FILTER SOCK IN FT — DIAMETER OF COMPOST FILTER SOCK REQUIRED: 8 INCH	12 INCH
2 (OR LESS)	300	375
5	200	250
10	100	125
15	70	85
20	50	65
25	40	50
30	30	40
35	30	40
40	30	40
45	20	25
50	20	25

REFERENCE:
UNITED STATES DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE 2011

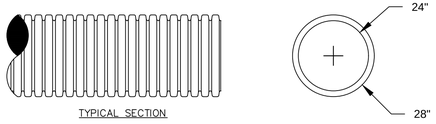
01 C-603 — 12" COMPOST FILTER LOG
FILTREX SILTOXX OR APPROVED EQUIVALENT



TOP VIEW — SIDE VIEW — FRONT VIEW

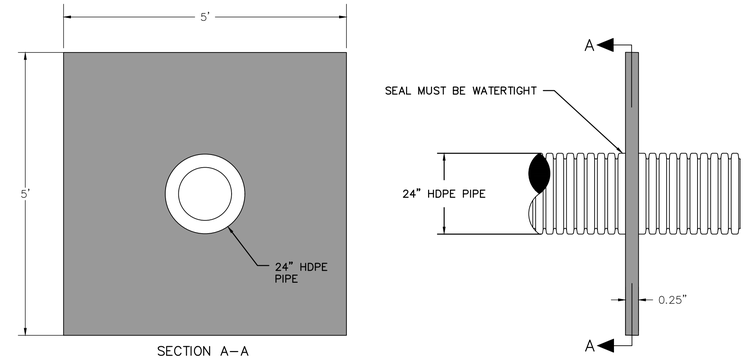
PIPE SIZE (IN)	A (IN)	B (IN) (MAX)	H (IN)	L (IN)	W (IN)
24	7.5	15	6.5	36	45

02 C-603 — 24" HDPE FLARED END SECTION
ADS OR APPROVED EQUIVALENT



TYPICAL SECTION

03 C-603 — 24" DUAL WALL SMOOTH INTERIOR HDPE PIPE
ADS N-12 OR APPROVED EQUIVALENT



SECTION A–A

04 C-603 — 5'X5' HDPE ANTI-SEEP COLLAR
SHEIB DRAINAGE OR APPROVED EQUIVALENT

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Review by: GEH

ORONOGO-DUENWEG MINING BELT SUPERFUND SITE
PHASE 01
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INTERMEDIATE REMEDIAL DESIGN BID SET
EPA REGION 7

CONSTRUCTION DETAILS

DRAWING NO.
C-603

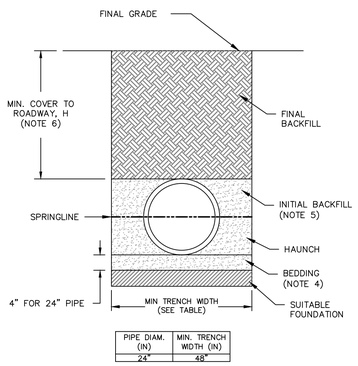
NOTES:

1. ALL PIPE SYSTEMS SHALL BE INSTALLED IN ACCORDANCE WITH ASTM D2321, "STANDARD PRACTICE FOR UNDERGROUND INSTALLATION OF THERMOPLASTIC PIPE FOR SEWERS AND OTHER GRAVITY FLOW APPLICATIONS", LATEST EDITION, WITH THE EXCEPTION THAT THE INITIAL BACKFILL MAY EXTEND TO THE CROWN OF THE PIPE. SOIL CLASSIFICATIONS ARE PER THE LATEST VERSION OF ASTM D2321. CLASS IVB MATERIALS (MH, CH) AS DEFINED IN PREVIOUS VERSIONS OF ASTM D2321 ARE NOT APPROPRIATE BACKFILL MATERIALS.
2. MEASURES SHOULD BE TAKEN TO PREVENT MIGRATION OF NATIVE FINES INTO BACKFILL MATERIAL, WHEN REQUIRED.
3. FOUNDATION: WHERE THE TRENCH BOTTOM IS UNSTABLE, THE CONTRACTOR SHALL EXCAVATE TO A DEPTH REQUIRED BY THE ENGINEER AND REPLACE WITH SUITABLE MATERIAL AS SPECIFIED BY THE ENGINEER. AS AN ALTERNATIVE AND AT THE DISCRETION OF THE DESIGN ENGINEER, THE TRENCH BOTTOM MAY BE STABILIZED USING A GEOTEXTILE MATERIAL.
4. BEDDING: SUITABLE MATERIAL SHALL BE CLASS I (SEE TABLE TO THE RIGHT). THE CONTRACTOR SHALL PROVIDE DOCUMENTATION FOR MATERIAL SPECIFICATION TO ENGINEER. UNLESS OTHERWISE NOTED BY THE ENGINEER, MINIMUM BEDDING THICKNESS SHALL BE 4" FOR 24" DIAMETER PIPE. MATERIAL SHALL BE INSTALLED AS REQUIRED IN ASTM D2321.
5. INITIAL BACKFILL: SUITABLE MATERIAL SHALL BE CLASS I IN THE PIPE ZONE EXTENDING TO THE CROWN OF THE PIPE. THE CONTRACTOR SHALL PROVIDE DOCUMENTATION FOR MATERIAL SPECIFICATION TO ENGINEER. MATERIAL SHALL BE INSTALLED AS REQUIRED IN ASTM D2321, LATEST EDITION. FILL SHALL ACHIEVE 95% COMPACTION. PLEASE NOTE, CLASS IV MATERIAL HAS LIMITED APPLICATION AND CAN BE DIFFICULT TO PLACE AND COMPACT; USE ONLY WITH THE APPROVAL OF A SOIL EXPERT.
6. MINIMUM COVER: DURING CONSTRUCTION FOLLOW MINIMUM RECOMMENDED COVER BASED ON SITE TRAFFIC.

MINIMUM RECOMMENDED COVER "H" BASED ON VEHICLE LOADING CONDITIONS

	SURFACE LIVE LOADING CONDITION	
PIPE DIAM.	H–25	HEAVY CONSTRUCTION (75T AXLE LOAD) *
24"	12"	48"

* VEHICLES IN EXCESS OF 75T MAY REQUIRE ADDITIONAL COVER



PIPE DIAM. (IN)	MIN. TRENCH WIDTH (IN)
24"	48"

01 / C-604 PIPE TRENCH INSTALLATION

SCALE: AS SHOWN

ASTM D2321 [1] (CSA B182.11) CLASS DESCRIPTION		ASTM D2487 NOTATION	ASTM D2487 DESCRIPTION	AASHTO M43 NOTATION	AASHTO M145 NOTATION	BNQ 2560	ASTM D2321 [1] (CSA B182.11) PERCENTAGE PASSING SIEVE SIZES 1 1/2 IN. (40mm)	3/8" (9.5mm)	No. 4 (4.75mm)	NO. 200 (0.075mm)	ATTERBERG LIMITS LL	PI	COEFFICIENTS Cu	Cc
I [2]	CRUSHED ROCK, ANGULAR [3]	N/A	ANGULAR CRUSHED STONE OR ROCK, CRUSHED GRAVEL, CRUSHED SLAG; LARGE VOIDS WITH LITTLE OR NO FINES	5, 56, 57 [4] 6, 67 [4]	N/A		100%	<25%	<15%	<12%	NON PLASTIC		N/A	
II	CLEAN, COARSE-GRAINED SOILS	GW	WELL-GRADED GRAVEL, GRAVEL-SAND MIXTURES; LITTLE OR NO FINES	5, 6	A1, A3	CG-14, MG-20	100%		<50% of "COARSE FRACTION"	<5%	NON PLASTIC		>4	1 to 3
		GP	POORLY-GRADED GRAVELS, GRAVEL-SAND MIXTURES; LITTLE OR NO FINES	56, 57, 67									4	<1 or >3
		SW	WELL-GRADED SANDS, GRAVELLY SANDS; LITTLE OR NO FINES						>50% of "COARSE FRACTION"				>6	1 to 3
		SP [6]	POORLY-GRADED SANDS, GRAVELLY SAND; LITTLE OR NO FINES										<6	<1 or >3
	COARSE-GRAINED SOILS, BODERLINE CLEAN TO W/FINES	GW-GC, SP-SM	SANDS AND GRAVELS WHICH ARE BORDERLINE BETWEEN CLEAN AND WITH FINES	N/A			100%		VARIES	5% TO 12%	NON PLASTIC		SAME AS FOR GW, GP, SW AND SP	
III	COURSE-GRAINED SOILS WITH FINES	GM	SILTY GRAVELS, GRAVEL-SAND-SILT MIXTURES	GRAVEL & SAND WITH <10% FINES	A-2-4, A-2-5, A-2-6, OR A-4 OR A-6 SOILS WITH MORE THAN 30% RETAINED ON #200 SIEVE		100%		<50% of "COARSE FRACTION"	12% TO 50%	N/A	<4 OR <"A" LINE	N/A	
		GC	CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES									<7 & >"A" LINE		
		SM	SILTY SANDS, SAND-CLAY MIXTURES						>50% of "COARSE FRACTION"			<4 OR <"A" LINE		
		SC	CLAYEY SANDS, SAND-CLAY MIXTURES									>7 & >"A" LINE		
	INORGANIC FINE-GRAINED SOILS	ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS, SILTS WITH SLIGHT PLASTICITY						100%	> 30% (RETAINED)	<50	<4 OR <"A" LINE		
		CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY; GRAVELLY, SANDY, OR SILTY CLAYS; LEAN CLAYS							> 30% (RETAINED)		>7 & >"A" LINE		
IV [5]	INORGANICS FINE-GRAINED SOILS	ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS, SILTS WITH SLIGHT PLASTICITY	N/A	A-2-7 OR A-4 OR A-6 SOILS WITH 30% OR LESS RETAINED ON #200 SIEVE		100%		100%	< 30% (Retained)	<50	<4 or <"A" LINE	N/A	
		CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY; GRAVELLY, SANDY, OR SILTY CLAYS; LEAN CLAYS	N/A								>7 & >"A" LINE		
V [7]	INORGANIC FINE-GRAINED SOILS	MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SANDY OR SILTY SOILS, ELASTIC SILTS	N/A	A5, A7		100%		100%	>50%	>50	<"A" LINE	N/A	
		CH	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS	N/A								>"A" LINE		
	ORGANIC SOILS OR HIGHLY ORGANIC SOILS	OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY	N/A			100%		100%	>50%	<50	<4 OR <"A" LINE	N/A	
		OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS	N/A							>50	<"A" LINE		
		PT	PEAT AND OTHER HIGH ORGANIC SOILS	N/A										

NOTES:

1. REFER TO ASTM D2321 / CSA B182.11 / BNQ 2560 FOR MORE COMPLETE SOIL DESCRIPTIONS.
2. CLASS I MATERIALS ALLOW FOR A BROADER RANGE OF FINES THAN PREVIOUS VERSIONS OF D2321 / B182.11. WHEN SPECIFYING CLASS I MATERIAL FOR INFILTRATION SYSTEMS, THE ENGINEERING SHALL INCLUDE A REQUIREMENT FOR AN ACCEPTABLE LEVEL OF FINES.
3. ALL PARTICLE FACES SHALL BE FRACTURED.
4. ASSUMES LESS THAN 25% PASSES THE 3/8" SIEVE.
5. CLASS IV MATERIALS REQUIRE A GEOTECHNICAL EVALUATION PRIOR TO USE AND SHOULD ONLY BE USED AS BACKFILL UNDER THE GUIDANCE OF A QUALIFIED ENGINEER.
6. UNIFORM FINE SANDS (SP) WITH MORE THAN 50% PASSING A 100 SIEVE BEHAVE LIKE SILTS AND SHOULD BE TREATED AS CLASS III SOILS IF ALLOWED.
7. CLASS V MATERIALS SHALL NOT BE PERMITTED AS BEDDING AND BACKFILL MATERIAL.

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